



WASHINGTON STATE DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE
4601 NORTH MONROE
SPOKANE, WASHINGTON 99205-1295

FINAL STATEMENT OF BASIS
FOR
AIR OPERATING PERMIT NUMBER 02AQER-4970 1st Revision
AVISTA CORPORATION
KETTLE FALLS GENERATING STATION
KETTLE FALLS, WASHINGTON

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LIST OF ABBREVIATIONS

AOP	Air Operating Permit
BACT	Best Available Control Technology
BTU	British Thermal Units
°C	Degrees Celsius
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CO	Carbon Monoxide
COMS	Continuous Opacity Monitoring System
dscf	Dry Standard Cubic Foot
dscf/m	Dry Standard Cubic Foot per minute
Ecology	Washington State Department of Ecology
E.I.T.	Engineer in Training
EPA	United States Environmental Protection Agency
°F	Degrees Fahrenheit
FCAA	Federal Clean Air Act
ft ³	Cubic foot
gr/dscf	Grains per dry standard cubic foot
hr	Hour
lb	Pound
MMBtu	Million British Thermal Units
MRRR	Monitoring, Recordkeeping, and Reporting Requirement
NOC	Notice of Construction
NO _x	Oxides of Nitrogen
NSPS	New Source Performance Standard
O ₂	Oxygen
O&M	Operation & Maintenance
P.E.	Professional Engineer
PM	Particulate Matter
PM-10	Particulate Matter with aerodynamic diameter ≤ 10 micrometers
ppm	Parts per million
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RCW	Revised Code of Washington
RM	EPA Reference Method from 40 CFR Part 60, Appendix A
scfm	Standard Cubic Feet per Minute
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
T	Temperature
TAP	Toxic Air Pollutant
TPD	Tons Per Day
TPY	Tons Per Year
TSP	Total Suspended Particulate
VOC	Volatile Organic Compound
WAC	Washington Administrative Code
w%	Percentage by Weight
yr	Year

Relevant Chemical Information

Chemical Abbreviation	Chemical Name	Comments
NH ₃	Ammonia	Colorless gas with a penetrating, pungent suffocating odor detectable at 17 ppm. Can also be a liquid if under pressure, or an aqueous solution.
N ₂ H ₄	Hydrazine	Colorless liquid with a weak ammonia odor detectable at 3 to 4 ppm. Can also be a solid at temperatures less than 36° F.
HCl	Hydrochloric Acid	Colorless gas with an irritating, pungent odor
Hg	Mercury	Silvery, mobile, odorless liquid
HNO ₃	Nitric Acid	Colorless, yellow, or red fuming liquid with an acrid, suffocating odor
H ₃ PO ₄	Phosphoric Acid	Viscous, colorless, odorless liquid
H ₂ SO ₄	Sulfuric Acid	Colorless to dark brown, oily, dense liquid with a sharp, acrid odor

Selected Emission Units – Annual Potential To Emit in Tons Per Year (tpy)

Emission Units	PM-10 (tpy)	CO (tpy)	NO _x (tpy)	SO ₂ (tpy)	HC (tpy)
Hog Fuel Boiler ¹	(>100)*				
	90	4635	540	6.5	210
Natural Gas Combustion Turbine ²	2.8	74.0	39.0	0.3	3.3

* Indicates pre-controlled emissions from sources to which Compliance Assurance Monitoring is applicable as reported in proposed CAM plan submitted to Ecology on August 3, 2001.

1.0 Introduction

This document sets forth the legal and factual basis for the permit conditions in a **FINAL** 1st Revision to AOP No. 02AQER-4970 issued by the State of Washington Department of Ecology for a steam electric generating facility fired on wood waste and natural gas located near Kettle Falls, Washington. This document is called a “statement of basis” and is required by Washington State regulations [chapter 173-401 WAC]. A statement of basis does not contain enforceable permit conditions. Enforceable permit conditions are contained in the AOP itself.

2.0 Facility Identifying Information

2.1 Company Name -----Avista Corporation

2.2 Facility Name ----- Kettle Falls Generating Station

2.3 Unified Business Identification Number----- 328-000-223

¹ Annual potential to emit values as submitted by Avista Corporation on August 3, 2001 as part of the AOP renewal application.

² Annual potential to emit values per NOC Order No. 02AQER-3519.

- 2.4** Facility Address ----- 1151 Highway 395 North, Kettle Falls, Washington 99141
- 2.5** Responsible Official ----- Scott Morris, President, Avista Utilities
Mailing Address ----- P.O. Box 3727, Spokane, Washington 99220-3727
- 2.6** Facility Contact ----- Hank Nelson, Environmental Coordinator
- 2.7** Facility Contact Phone Number ----- (509) 495-4613

3.0 Basis for Title V Applicability

Avista Corporation, Kettle Falls Generating Station, is subject to Title V, Air Operating Permit Regulations, due to the potential to emit the following pollutants in excess of 100 tons per year; carbon monoxide (CO), oxides of nitrogen (NO_x), and total hydrocarbons (HC). WAC 173-401-200(17)(b) identifies any source that directly emits or has the potential to emit one hundred tpy or more of any air pollutant as a major source. Major sources are required to obtain Title V permits under 173-401-300(1)(a)(i).

4.0 Attainment Classification

The facility is located in an area that is classified as attainment for all criteria pollutants as of June 2003.

5.0 Title V Facility Timeline

- 5.1** December 8, 1994 ----- Source became subject to Title V AOP Program
- 5.2** August 21, 1996 ----- Original Title V AOP is issued (Order No. DE 96AQ-E127)
- 5.3** August 20, 2001 ----- Expiration of original Title V AOP
- 5.4** March 31, 2003 ----- Draft 1st Revision of Order No. 02AQER-4970 Issued
- 5.5** April 10, 2003 ----- Public Comment Period on Draft 1st Revision Begins
- 5.6** May 9, 2003 ----- Public Comment Period on Draft 1st Revision Ends
- 5.7** May 12, 2003 ----- Proposed 1st Revision Issued
- 5.8** May 14, 2003 ----- EPA Review Period on Proposed 1st Revision Begins
- 5.9** June 27, 2003 ----- EPA Review Period on Proposed 1st Revision Ends
- 5.10** June 27, 2003 ----- Final 1st Revision Issued
- 5.11** July 1, 2003 ----- Final 1st Revision Effective
- 5.12** November 1, 2007 ----- Order No. 02AQER-4970 Expiration Date

6.0 Facility Description

The Kettle Falls Generating Station (KFGS) is located about 3 miles northwest of Kettle Falls, Washington, in Stevens County. The KFGS property consists of 46 acres, and is owned and operated by Avista Corporation (Avista). The KFGS is a wood-waste fired steam-electric generating station, Standard Industrial Classification Code 4911 (Electric power generation, transmission or distribution), rated at 50 megawatts (MW) and can produce up to 53.5 MW gross. On March 5, 2002, Avista was issued Ecology Order No. 02AQER-3519 approving construction/installation of a 6.9 MW nominal Solar combustion turbine, fired on natural gas. Construction of the KFGS began in 1981 and commercial operation began in December 1983. The wood-waste burned in the boiler is from sawmills and other sources of wood-waste located within a 200-mile radius of the station. Natural gas is used for startup, as an auxiliary fuel, and during abnormal conditions.

The KFGS uses a wood-waste fired spreader stoker boiler to produce steam to drive a single shaft turbine-generator for the production of electricity. The facility site plan in Appendix A shows the layout of the KFGS including the locations, processes and equipment associated with emissions of air pollutants. Industrial activity occurs throughout the site. The KFGS is an integrated facility that includes wood-waste receiving, handling, and storage; particulate emission control devices, and ash handling. Figures 1 through 6 in Appendix B (Process Flow Diagrams) identify the flow of feed materials and byproducts to and from the KFGS. Major equipment or processes include: wood-waste receiving, handling system and storage, boiler and fuel firing system, turbine – generator, particulate matter removal system, ash handling system, water treatment system (purification), cooling towers, and wastewater treatment system.

6.1 *Wood-waste handling* equipment at the KFGS receives and unloads the fuel, weighs it, sorts it by size, reduces the size of large pieces of fuel, and delivers it to the boiler. Wood-waste transported to the site by truck is unloaded by one of two truck dumpers to a receiving hopper and then onto a conveyor. In addition to the truck unloading, oversize wood rejected from the final fuel screening prior to entering the boiler can be reloaded onto the conveyor for further processing. Fuel from the receiving hoppers is conveyed at a rate of 300 tons per hour past a self-cleaning magnet and metal detector to a disc screen. The magnet and metal detector remove any tramp iron from the wood, and the disc screen separates the wood according to size. Wood scraps up to a maximum of four inches in size are moved via covered conveyor belt to the stackout system. Oversize material is rejected to a hammer mill where it is broken into smaller pieces.

The KFGS uses two stackout systems. The first uses a traveling tripper conveyor to distribute wood-waste to the fuel storage pile, where a bulldozer distributes the fuel in the storage area. The second system employs a swinging boom to distribute the fuel onto the live storage pile at the reclaim area. From the live storage pile, an over-the-pile reclaimer moves the fuel onto a conveyor in the main reclaim area for transport into the power plant. Alternatively, fuel can be reclaimed at the auxiliary reclaimer feed by a bulldozer. From the auxiliary reclaim box, fuel is transferred via a box-chain conveyor to belt conveyors that transfer it to the boiler. Fuel from the reclaim area is moved on a covered conveyor to a transfer tower where it passes through a disc screen and then into the powerhouse via a covered conveyor. Oversize material rejected from the screen drops down a chute to a collection area where it is eventually gathered by a front-end loader and taken to the Reload bin for reintroduction into the wood-waste handling system. The outside storage area is uncovered and provides about a 150-day storage capacity.

6.2 *In the powerhouse*, an enclosed drag-chain conveyor carries the wood-waste to six fuel-feeder bins mounted near the plant's boiler. In order to avoid starving the bins, the conveyor is designed to supply 10 percent more fuel than the expected maximum fuel burn rate. Excess fuel is returned to the storage area via conveyor. Twin-screw, variable speed feeders remove wood-waste from the bottom of six fuel bins. The wood-waste fuel firing system consists of six (6) pneumatic distributors that distribute the fuel evenly across a moving grate, with smaller particles of fuel burned in suspension and larger particles burning on the grate. The boiler is a CE Type VU-40, sub-critical, natural circulation, wood-waste fired, balance draft boiler with a furnace volume of 42,649 cubic feet. The boiler is rated at 415,000 pounds of steam per hour. It produces 1,500 psig steam at a temperature of 950 degrees Fahrenheit.

The boiler can also be fired with natural gas. Under normal operation, natural gas is primarily used for startup, however the boiler can be operated on natural gas at low load conditions. The boiler is equipped with four natural gas burners capable of providing a total heat input of a maximum of 245 million British Thermal Units per hour (MMBtu/hr). The original boiler design consisted of eight gas nozzles (spuds) with twelve holes in each, to provide a flow rate of 61,220 standard cubic feet per hour per nozzle. Based on this design information, provided by ABB C-E Services, Inc. (boiler

manufacturer), each nozzle hole corresponds to approximately 5,270,000 British Thermal Units per hour (Btu/hr) of heat input. The boiler was modified by removing four of the eight gas nozzles and welding close one nozzle hole (in opposing corners) in two of the remaining nozzles. The net effect was a gas firing potential of 242.42 MMBtu/hr, or less than 245 MMBtu/hr.

The boiler is equipped with six retracting Diamond Power soot blowers. The soot blowers are sequentially operated and electrically driven, with 385 psig steam as the blowing medium, to blow soot from the boiler tubes. Soot blowing occurs on a weekly schedule, usually twice per week for about two hours.

- 6.3** *Turbine – Generator.* Steam from the boiler is supplied to an 18-stage single-flow General Electric (GE) condensing turbine to produce mechanical energy for driving a direct-coupled alternating current (AC) generator. The GE turbine is a straight condensing, single-flow machine designed for inlet steam conditions of 1,450 psig at 950 °F, with a maximum guaranteed rating of 46,000 kilowatts at 2.5 in. (Hg) absolute back pressure while extracting steam for four stages of feedwater heating. The GE generator is a 13.8 kilovolt, 3600 rpm, three-phase, hydrogen inter-cooled, synchronous machine, and rated 53,400 kilovolt-amperes (KVA) (maximum of 53,500 KVA) at 0.95 power factor, with a 0.58 short circuit ratio. Excitation is provided by a GE solid state, power potential transformer/power current transformer, thyristor-controlled, self-excitation system.

A digital coordinated control system operates the plant as an integrated unit. The system regulates the rate of steam generation, controls how much fuel is added to the boiler, and ensures that proper amounts of air are injected into the system for safe, efficient combustion. The control system also adjusts how much water is supplied to the boiler, regulates turbine throttle pressure, and maintains steam temperature. The plant's turbine is equipped with a digital electro-hydraulic control system that regulates the speed and load of the turbine-generator. The control operator can start up, load, and shut down the unit from the control room. In addition, control-room operators can monitor and control major auxiliary systems, such as fuel handling and ash handling. All process emissions from the boiler are discharged from a single main stack downstream of the particulate matter control system. The stack is 180 feet tall, 10 feet in diameter, and has test ports and an opacity meter located about half way up for stack testing and continuous opacity monitoring, accessible by ladder.

- 6.4** *The ash handling system* consists of screw conveyors that collect ash from the boiler grate, siftings hoppers, air heater, mechanical collector and electrostatic precipitator (ESP). Bottom ash and siftings ash, which consists mostly of sand and rocks originally mixed in with the wood-waste, is transferred to temporary storage by conveyor to a partially enclosed bunker (walls on three sides) just outside the south wall of the boiler building. This ash is periodically loaded into a truck for transport to a solid-waste landfill operated by Avista.

Fly ash from the air heater, mechanical collector, and the ESP are collected and conveyed to the fly ash storage area. The fly ash storage area is within a partial enclosure (top and three sides) to minimize the generation of fugitive dust. The final fly ash conveyor to the fly ash storage area is a screw type conveyor. In the final section of the conveyor, water is added and mixed in with the ash to reduce the potential for dust generation when being dropped to the pile. Ash is removed from the ash pile with a front-end loader and loaded into a truck for transport to a solid-waste landfill operated by Avista.

- 6.5** *Water Treatment.* Boiler water for the plant is obtained from the Kettle Falls municipal water system. Because of the hardness of the supplied water, treatment is needed prior to use in the boiler. In the water treatment building, two demineralizer systems employ ion exchange to remove excess hardness. Resins used for ion exchange are regenerated after treating roughly 44,000 gallons of water. The cation exchange resins are regenerated using sulfuric acid, while the anion exchange

resins are regenerated using caustic soda. The sulfuric acid and caustic soda are stored in the water treatment building in two 7,500 gallon above-ground tanks. The effluent from regeneration passes to a neutralization sump, and then discharges to the outdoor retention basins.

Other chemicals added to the boiler water include hydrazine for oxygen scavenging, and small amounts of ammonia for pH control. Hydrazine is stored in 55 gallon drums at the KFGS. A hand pump is installed in the drum and piped into the day tank where it is diluted and pumped as needed. Usage is approximately 0.28 gallons per day of operation, or 2.2 pounds per day of operation. A chemical laboratory in the boiler building receives samples from 11 different points in the plant. These samples are used to detect and control corrosion and check the performance of systems used for feedwater treatment.

- 6.6** The KFGS has a mechanical draft *cooling tower*. It is a two-cell wood tower, designed to reject a heat load of 310,000,000 Btu/hr from 30,400 gpm, 95.4 °F inlet water. The water is cooled by 20.4 °F to about 75 °F. Draft is produced by two fans rated at 1,402,000 actual cubic feet per minute (acfm). Chemical treatment of the cooling tower water includes injection of chlorine gas for biological control, addition of sulfuric acid for pH control, and use of a chemical reagent (organo-phosphorous compound) for scaling control. The organo-phosphorus portion of the chemical reagent is HEDP, or 1-Hydroxyethylidene-1, 1-Diphosphonic Acid. The MSDS for this product lists HEDP as the only hazardous ingredient. Usage is approximately 2.0 gallons per day of operation, or 21.0 pounds per day of operation. The chlorine gas is stored in a segregated portion of the water treatment building, while the other chemicals are stored in the main part of the water treatment building.
- 6.7** *Wastewater* from various locations at the KFGS are processed by the wastewater treatment system. The wastewater treatment system processes about 124,000 gallons per day on an average basis. Sources discharging water to the treatment system include cooling tower water blowdown, which accounts for over 80% of the water treated, boiler water blowdown, effluent from the demineralizer regeneration process, and water from the oil/water separators. Sanitary wastes are not treated by the wastewater treatment system. The components of the treatment system include two settling ponds, a retention basin, and a clarifier. Wastewater received from the plant goes to the settling ponds, then on to the retention basin. When the retention basin is full, the wastewater is passed through the clarifier and either recirculated through the system or discharged to the river. Chemicals are not added to the clarifier, and it is not operated as a clarifier; rather, it acts as a tank through which the wastewater passes.
- 6.8** *Ash* from the combustion of the wood-waste is collected in a two-stage control system. Particulate matter in the flue gas is controlled by an electrostatic precipitator (ESP). Prior to entry into the ESP, larger particles in the flue gas are removed in a mechanical collector (cyclone separators). The Flakt, Inc. ESP has 122,723 square feet (sq. ft.) of collecting surface area, four fields, and maximum power consumption of 190 kW. It is designed to limit emissions to 0.020 grains/dscf or better.
- The mechanical collector is used to remove the larger particles in the flue gas stream prior to entering the ESP and has a collection efficiency of about 70 percent. Ash collected in the mechanical collector, which consists of larger particles and char, can be re-injected into the boiler. Ash re-injection reduces both fuel consumption and ash generation and is used during normal operation. The combined particulate matter control efficiency of the ESP and mechanical collector is at least 99.5 percent. An induced draft (ID) fan is located downstream of the mechanical collector and before the ESP. The ID fan is driven by a 700-hp electric motor.
- 6.9** *Fugitive dust* emissions from material handling are controlled through a variety of methods:

Fugitive Dust Emission Source	Method of Fugitive Dust Control
Access roads	Access roads and areas of general vehicle travel are paved
Paved areas	Routinely hosed down after winter (spring washdown) to remove accumulated materials
General housekeeping	Done on an as needed basis
Wood waste system transfer towers	Accumulated material removed on a daily basis
Wood waste system conveyors	Covered
Wood waste reclamation system	Wood-waste normally reclaimed into an underground bunker
Ash collection, conveying, storage, and loadout	Watering and wet suppression
Ash collection and conveying	Enclosed conveyors
Bottom ash storage	Stored in an enclosed bunker
Fly ash storage	Stored in a building (enclosed on 3 sides and top)
Fly Ash Transfer to Storage Pile	Water mixed with ash in screw conveyor prior to dropping to pile
Fly Ash Loadout	Loadout area washed down after each loadout, depending on weather conditions, and on an as needed basis

6.10 The KFGS operates a continuous opacity monitor to record opacity in the boiler exhaust stack. The opacity monitor data is continuously recorded in a computer file in addition to a digital indicator on the control panel in the boiler control room. Other compliance monitoring performed on a non-continuous basis includes recording daily, monthly, and annual wood-waste, as well as natural gas usage by the boiler. The KFGS is a plant that could operate 24 hours per day, 355 days per year. For at least 10 days out of the year the station is down for repair and maintenance. Therefore, the maximum hours of facility operation are 8520 hours per year. Trucked in wood-waste is received at the facility between the hours of 0600 through 0200 Monday through Friday; between 0600 through 1630 on Saturdays; and is not received on Sundays.

7.0 Facility Emission Units/Processes

7.1 Facility Wide (Section 2.1 in AOP)

7.2 Wood Waste Collection and Transport System (Section 2.2 in AOP)

7.3 Hog Fuel Boiler (Section 2.3 in AOP)

7.4 Natural Gas Combustion Turbine (Section 2.4 in AOP)

8.0 Insignificant Emission Units and Activities

8.1 The permittee proposed numerous insignificant emission units as categorically insignificant based on the requirements outlined in WAC 173-401-532. A list of these units is on file with the Department of Ecology's Eastern Region Office, Air Quality Program in Spokane, Washington.

- 8.2** The following insignificant emission units were proposed by the permittee and have been found by Ecology to meet the requirements outlined in WAC 173-401-533 as insignificant on the basis of size or production rate.
- 8.2.1** 100 gallon capacity hydrazine storage tank and 100 gallon ammonia storage tank – WAC 173-401-533(2)(a), Operation, loading and unloading of storage tanks and storage vessels, with lids or other appropriate closure, two hundred and sixty gallons capacity or less.
 - 8.2.2** One water chlorination system that is not part of the wastewater treatment system with capacity of 30,000 gallons per day – WAC 173-401-533(2)(p), municipal and industrial water chlorination facilities of no greater than twenty million gallons per day capacity. The exemption does not apply to wastewater treatment.
 - 8.2.3** Eight natural gas heaters generating a maximum of 1.39 MMBTU/hr – (WAC 173-401-533(2)(r), space heaters and hot water heaters using natural gas, propane, or kerosene and generating less than five million BTU per hour.
 - 8.2.4** 7,500 gallon storage tanks, one containing sodium hydroxide, and one containing sulfuric acid whose concentration is less than 99% – WAC 173-401-533(2)(s), tanks, vessels, and pumping equipment, with lids or other appropriate closure for storage or dispensing of aqueous solution of inorganic salts, bases and acids excluding 99% or greater H_2SO_4 or H_3PO_4 , 70% or greater HNO_3 , 30% or greater HCl , or more than one liquid phase where the top phase is more than one percent VOC's.
 - 8.2.5** The permittee has one fume hood, which is used twice per month, and one vacuum pump, which is used once per month. These units are used only during the water quality analysis that the permittee performs on the process water. Ecology has determined that these two units are insignificant under WAC 173-401-533(3)(c), chemical or physical analytical laboratory operations or equipment including fume hoods and vacuum pumps.
 - 8.2.6** As part of the National Pollutant Discharge Elimination System (NPDES) permitted wastewater treatment system, the permittee operates two settling basins and one retention pond. Ecology has determined that these facilities are insignificant under WAC 173-401-533(3)(d), NPDES permitted ponds and lagoons utilized solely for the purpose of settling suspended solids and skimming of oil and grease.
 - 8.2.7** The permittee operates a parts washer that contains 10 gallons of Isopar L Fluid. The Material Safety Data Sheet (MSDS) for the substance states that the vapor pressure is 1 millimeters of mercury (mmHG) at 68°F. Based on information contained in WAC 173-401-533(2)(t), Ecology has determined that the substance does not have a high enough vapor pressure at room temperature to be considered a VOC and is subsequently exempt under WAC 173-401-533(2)(z).
- 8.3** The following insignificant emission units were proposed by the permittee and have been found by Ecology to meet the requirements outlined in WAC 173-401-530(4) as insignificant on the basis of actual emissions.
- 8.3.1** The permittee has established (via recordkeeping of hours of operation) that the actual emissions from emergency generator and emergency fire pump (both diesel fired) have been below the significance levels in the recent past. However, in order to continue to establish these emission units as insignificant, the permittee must continue

to maintain records of hours of operation. This data will be submitted to Ecology as emission inventory data.

- 8.3.2** The permittee currently has two diesel storage tanks (12,000 and 20,000 gallon capacity) on site. Estimates of the emissions from these tanks (made using EPA TANKS 4.09 modeling software) indicate that the potential to emit is far below significance levels. Emissions from each tank was estimated at less than fifty (50) pounds of diesel fumes per year.

9.0 Comments and Corresponding Responses

- 9.1** Comments received during the public comment period and EPA review period are on file at Ecology's Eastern Region Office in Spokane, along with Ecology's response to the comments.

10.0 Applicable and Inapplicable Requirements Determinations/Explanations

- 10.1** Initial or one-time NOC requirements that have not been included in the AOP as ongoing applicable requirements.

- 10.1.1** Order No. DE 95AQ-E131 First Amendment, Approval Condition 6.5, If construction of the project is not commenced within eighteen (18) months after receipt of the Order approving the Notice of Construction, the approval shall become void.

- 10.1.1.1** Correspondence from Avista Corporation received June 30, 1995 states that the date the facility will resume full load operation is July 5, 1995. Since the original Order was issued on June 16, 1995, it is clear that construction of the project was commenced within eighteen (18) months after receipt of the Order. This correspondence is located in the facility Permit file at Ecology's Eastern Regional Office in Spokane, Washington.

- 10.1.2** Order No. DE 95AQ-E131 First Amendment, Approval Condition 4, O&M manuals for all equipment that has the potential to affect emission to the atmosphere shall be developed. Revision of the O&M manual(s) shall be completed within 180 days of issuance of this Order and a copy sent to Ecology for approval.

- 10.1.2.1** Documentation dated 09/01/95 indicates that Ecology received the O&M manual from Avista on September 1, 1995, and that the manual was satisfactory. This correspondence is located in the facility Permit file at Ecology's Eastern Regional Office in Spokane, Washington.

- 10.1.3** Order No. DE 95AQ-E131 First Amendment, Approval Condition 6.4, The modification of the plant to limit natural gas firing capacity to less than 250 million BTU per hour shall require a separate Notice of Construction.

- 10.1.3.1** The Notice of Construction application materials were received by Ecology on August 3, 1995. Departmental correspondence from Jerry Scheibner dated August 4, 1995 to Avista Corporation determined that an Order was not necessary for this modification due to the fact that the modification did not result in an increase in emissions. This correspondence is located in the facility General file at Ecology's Eastern Regional Office in Spokane, Washington.

- 10.1.4** Order No. DE 95AQ-E131 First Amendment, Approval Condition 6.4, Within six months of the date of this Order, the permittee shall permanently alter the plant's ability to fire natural gas at any input rate greater than or equal to 250 million BTU per hour.

- 10.1.4.1** Several articles of correspondence for the facility indicate that the work to limit natural gas firing capacity took place around June 1995. This correspondence is located in the facility General file at Ecology's Eastern Regional Office in Spokane, Washington.
- 10.1.5** Order No. DE 95AQ-E131 First Amendment, Approval Condition 6.7, The permittee must notify Ecology in writing at least ten (10) days prior to start up of the modified plant.
 - 10.1.5.1** Notification of start up of the modified plant was received by Ecology on June 30, 1995. This correspondence is located in the facility Permit file at Ecology's Eastern Regional Office in Spokane, Washington.
- 10.1.6** PSD-X80-11, Issued 07/28/80, Approval Condition 4, This approval shall become void if on-site construction is not commenced within eighteen months after receipt of the approval order, or if on-site construction once initially commenced is discontinued for a period of eighteen months.
 - 10.1.6.1** While no correspondence was located which expressly states the date that construction of the facility began, it is clear from correspondence located in the facility general file that construction took place between 1981 and 1983. Correspondence documenting the initial source test is dated December 27, 1983, indicating that the facility was completely constructed and operating some time prior to that date.
- 10.1.7** PSD-X80-11, Issued 07/28/80, Approval Condition 6a, and 40 CFR 60.49b(b), Compliance with emission limits shall be demonstrated by source testing within sixty (60) days after achieving the maximum production rate.
 - 10.1.7.1** Correspondence documenting the initial source test is dated December 27, 1983, and is located in the facility general file. While there is no specific correspondence stating the date that the facility first achieved maximum production rate, it is evident that the initial source testing took place soon after the facility started up.
- 10.1.8** PSD-X80-11, Issued 07/28/80, Approval Condition 7, and 40 CFR 60.49b(a), EPA and DOE shall be notified of the commencement of construction date and start-up date within thirty (30) days of the date of their occurrence.
 - 10.1.8.1** While no specific correspondence could be located which indicated that the required notifications took place, the correspondence that exists indicates that there existed significant dialogue between the permittee and EPA/DOE during the initial stages of construction and start-up of the facility.
- 10.1.9** Order No. 02AQER-3519, Issued 03/05/02, Approval Condition 2.1, Within ninety (90) days of startup, performance tests for NO_x, CO, and PM-10 shall be performed on the combustion turbine during combined-cycle operation with the duct burner in full operation.
 - 10.1.9.1** This initial performance testing occurred on October 8-10, 2002. An Ecology representative was present during the testing on October 9, 2002.
- 10.1.10** Order No. 02AQER-3519, Issued 03/05/02, Approval Condition 1.3, The installation of the combustion turbine shall comply with WAC 197-60, Maximum Environmental Noise levels.

- 10.1.10.1** As of the date of permit issuance, the installation of the combustion turbine has been completed and no complaints regarding excessive noise levels were received.
- 10.1.11** Order No. 02AQER-3519, Issued 03/05/02, Approval Condition 6.1, The permittee shall provide written notification to Ecology of completion of the O&M manual for the turbine project and associated equipment within sixty (60) days of installation of the unit.
- 10.1.11.1** Specific notification that the O&M manual is complete was received on April 29, 2003.
- 10.1.12** Order No. 02AQER-3519, Issued 03/05/02, Approval Condition 6.2 and 40 CFR 60.7(3), The permittee shall provide written notification to Ecology within fifteen (15) days of installation of the turbine and associated equipment.
- 10.1.12.1** Specific correspondence was received on 12/12/02 notifying Ecology that the turbine and associated equipment was installed.
- 10.1.13** 40 CFR 60.46b(b), (d), 07/01/01, Compliance with the particulate matter emission standards and opacity limits shall be determined through performance testing as described.
- 10.1.13.1** The facility has been tested for particulate matter emissions and opacity using EPA reference methods on multiple occasions. The source test reports are on file with Ecology in the source testing file for the KFGS.
- 10.2** The following NOC and/or PSD requirements clarified miscellaneous issues with regard to the applicable emission unit and were not, in actuality, approval conditions. These requirements therefore have not been included in the AOP as ongoing applicable requirements.
- 10.2.1** Order No. DE 95AQ-E131 Second Amendment, Issued 07/11/02, Approval Condition 6.1
- 10.2.1.1** This approval condition states that Order No. DE 95AQ-E131 Second Amendment supercedes the previous Order applying to the hog fuel boiler, Order No. DE80-254.
- 10.2.2** PSD-X80-11, Issued 07/28/80, Approval Condition 2
- 10.2.2.1** This condition clarifies that the emissions increase from the original construction of the Kettle Falls Generating Station will result in emission increases of 250 tpy or more only for particulate matter, oxides of nitrogen, carbon monoxide, and hydrocarbons.
- 10.2.3** PSD-X80-11, Issued 07/28/80, Approval Condition 6c
- 10.2.3.1** This condition states that an annual compliance inspection will be performed on the facility by either the state or EPA. The condition of the PSD permit does not require any action to be taken on the part of the permittee.
- 10.2.4** PSD-X80-11, Issued 07/28/80, Approval Condition 8
- 10.2.4.1** This condition notifies the permittee concerning a recent court decision that EPA anticipated would have significant effect on the PSD permitting program. The condition advises that permittee that due to the effects caused by the court decision, PSD-X80-11 may be subject to reevaluation in the near

future. Ecology's records do not contain any indication that such a reevaluation ever took place.

11.0 Monitoring, Recordkeeping, and Reporting Requirement (MRRR) Sufficiency Explanations – The following section provides brief discussions regarding the reasoning behind the MRRR's included as part of the AOP. The criteria is that each MRRR must be sufficient to assure compliance with the associated condition, emission standard or work practice.

- 11.1 MRRR 1M** – No specific monitoring can reasonably be required for these requirements. The nature of the requirements makes it necessary to rely on the good faith of the permittee to conscientiously monitor site operations and to promptly report any deviations.
- 11.2 MRRR 2M** – This monitoring is used for conditions that require the source to maintain a certain status quo (e.g., O&M manual accessible to employees in operation of the equipment; maintaining replacement parts for routine repairs to monitoring equipment). To assure compliance with these provisions, the permittee is simply required to check that there has been no change in the status quo. Since such a change is unlikely, an annual inspection was deemed adequate.
- 11.3 MRRR 3M** – This MRRR was designed to provide sufficient response to complaints regarding facility emissions affecting the landowners neighboring or in the affected vicinity of the facility. Timeframes were chosen to provide the permittee with adequate time to respond appropriately as well as ensuring that complaints not go unnoticed.
- 11.4 MRRR 4M** – The monitoring has been designed to require periodic reviews of Operation and Maintenance manuals, the Ash Handling and Disposal Plan, and the original Notice of Construction application materials in order to evaluate whether current operational practices are being conducted in a manner consistent with the information upon which permitting has been based. The recordkeeping and reporting required ensure that practices which are not consistent with the submitted information will be addressed in a timely manner.
- 11.5 MRRR 5M** – The monitoring has been designed to require periodic walk-around surveys as the most simple and direct method to determine the presence of visible emissions. These surveys, in conjunction with a good faith effort on the part of the permittee to operate in accordance with the conditions of the AOP, are considered sufficient monitoring.
- 11.6 MRRR 6M** – The monitoring as specified has been designed based on the condition that all associated equipment is maintained in proper working condition. Using emission factors in conjunction with operational parameters is a feasible method of estimating emissions from an emission unit for which performance testing may not be feasible. The monitoring was designed with the goal of providing the permittee with sufficient opportunity to respond to upsets appropriately while at the same time avoiding significant environmental degradation.
- 11.7 MRRR 7M** – This monitoring has been specified to include the estimation of emissions based on the use of emission factors, as described in 11.6 above. However, this MRRR has been utilized only for emission units for which source testing has been, or will be conducted, and thus the calculations estimating emissions are required to use testing-derived emission factors.
- 11.8 MRRR 8M** – This monitoring has been specified to rely on periodic source testing in order to gain a reasonable assurance of compliance with the various pollutant limits that apply to the hog fuel boiler. Source testing is the most reliable method for determining emissions, and due to the size of the emission unit, testing is deemed reasonable.

- 11.9** **MRRR 9M** – This monitoring has been specified to apply generally to units subject to Compliance Assurance Monitoring (CAM). The monitoring is included specifically as required by 40 CFR 64.
- 11.10** **MRRR 10M** – A Continuous Opacity Monitor provides real time opacity information. The monitor must be calibrated and maintained in accordance with the quality assurance procedures in order to ensure that the data produced is valid. Because of its nature, this type of monitoring is sufficient.
- 11.11** **MRRR 11M** – This MRRR establishes the minimum monitoring, recordkeeping and reporting information necessary for reasonable assurance of compliance with the appropriate requirements applicable to the boiler.
- 11.12** **MRRR 12M** – The required response time and information required to be submitted as part of the reporting are in accordance with the permit condition and include the necessary information.
- 11.13** **MRRR 13M** – This MRRR establishes the minimum recordkeeping information necessary for reasonable assurance of compliance with the appropriate requirements applicable to the boiler O&M manual.
- 11.14** **MRRR 14M** – The monitoring described is specifically applicable to the hog fuel boiler for the purposes of Compliance Assurance Monitoring (CAM). Compliance Assurance Monitoring must be designed to provide reasonable assurance of compliance with emission limitations or standards for the pollutant specific emission unit. In order for a pollutant specific emission unit (PSEU) to be subject to CAM, the three (3) conditions described below must be met. The manner in which they are met by the hog fuel boiler is discussed below.
- 11.14.1** The PSEU must be subject to an emission limit for the applicable pollutant. In the case of the hog fuel boiler, the PSEU is subject to multiple emission limits specific to particulate matter. These applicable requirements are included in Section 2.3 Hog Fuel Boiler of the AOP.
- 11.14.2** The PSEU must utilize air pollution control equipment to reduce emissions of the applicable pollutant to a level that meets the established emission limit(s). In the case of the hog fuel boiler, the particulate emissions of the PSEU are controlled by a multiple cyclone and a dry electrostatic precipitator (ESP).
- 11.14.3** The PSEU must have pre-controlled emissions of the specific pollutant that meet or exceed the major source thresholds established in WAC 173-401-200(17). In the case of the hog fuel boiler, the pre-controlled emissions of particulate matter have been calculated to be greater than 100 tons per year (tpy), and thus exceed the major source threshold established in WAC 173-401-200(17).
- The proposed CAM monitoring has been designed to rely on electrostatic precipitator (ESP) secondary voltage in conjunction with stack opacity. Through published information and consultation with the ESP manufacturer, secondary voltage was identified as the primary indicator of ESP particulate matter removal efficiency. The particular trigger limits were set based on data obtained during the most recent source test as well as manufacturer advice and engineering judgment.
- 11.15** **MRRR 15M** – This monitoring has been specified to rely on periodic source testing in order to gain a reasonable assurance of compliance with the various pollutant limits that apply to the turbine. Source testing is the most reliable method for determining emissions, and due to the size of the emission unit, testing is deemed reasonable.

- 11.16 MRRR 16M** – This MRRR establishes the minimum monitoring, recordkeeping and reporting information necessary for reasonable assurance of compliance with the appropriate requirements applicable to the turbine. Much of the information is specifically required by 40 CFR 60, Subpart GG.
- 11.17 MRRR 17M** – The monitoring is included specifically as required by 40 CFR 60.
- 11.18 MRRR 18M** – This MRRR establishes the minimum recordkeeping information necessary for reasonable assurance of compliance with the appropriate requirements applicable to the turbine O&M manual.

12.0 Streamlining Explanations

- 12.1 PSD-X80-11, Condition 1 – Emissions of particulate matter from the hog fuel boiler** – This condition applies to the hog fuel boiler by limiting emissions of particulate matter to 114 tons per year. This applicable requirement has not been included in the AOP due to the fact that Order No. DE 95AQ-E131, Second Amendment includes a condition (Approval Condition 2.2) that limits particulate matter emissions from the hog fuel boiler to 90 tons per year. Since the condition included in the NOC Order is clearly more stringent and is expressed in the same units as the condition in PSD-X80-11, it is appropriate to apply streamlining to this requirement.
- 12.2 PSD-X80-11, Condition 1 – Emissions of carbon monoxide from the hog fuel boiler** – This condition applies to the hog fuel boiler by limiting emissions of carbon monoxide to 160 pounds per hour and 701 tons per year. The PSD permit was issued on July 28, 1980, and emission limitations were included using the best emission data available at that time. Subsequent data regarding actual emissions of carbon monoxide were identified in correspondence from the Washington Water Power Company (the former name of Avista Corporation) dated October 12, 1994 to USEPA Region X, and in subsequent correspondence from Region X dated October 17, 1994 and November 23, 1994. The new data indicated that the initial estimates of carbon monoxide emissions from the hog fuel boiler underestimated the actual emissions. The November 23, 1994 correspondence from EPA Region X specified that the emission limitations for carbon monoxide imposed by PSD-X80-11 be modified to 1,088 pounds per hour and 4,765 tons per year. Since a subsequent Order issued by the Washington State Department of Ecology includes emission limitations which are equally stringent in terms of pounds per hour (1,088) and more stringent in terms of tons per year (4,635) than the conditions in PSD-X80-11, it is appropriate to apply streamlining to the PSD requirements.
- 12.3 PSD-X80-11, Condition 1 – Emissions of nitrogen oxides from the hog fuel boiler** – This condition applies to the hog fuel boiler by limiting emissions of nitrogen oxides to 104 pounds per hour and 456 tons per year. The PSD permit was issued on July 28, 1980, and emission limitations were included using the best emission data available at that time. Subsequent data regarding actual emissions of nitrogen oxides were identified in correspondence from the Washington Water Power Company (the former name of Avista Corporation) dated October 12, 1994 to USEPA Region X, and in subsequent correspondence from Region X dated October 17, 1994 and November 23, 1994. The new data indicated that the initial estimates of nitrogen oxides emissions from the hog fuel boiler underestimated the actual emissions. The November 23, 1994 correspondence from EPA Region X specified that the emission limitations for nitrogen oxides imposed by PSD-X80-11 be modified to 120 pounds per hour and 526 tons per year. A subsequent Order issued in 1995 by the Washington State Department of Ecology approved plant modifications to the induced draft fan and included emission limitations of 142 pounds per hour and 540 tons per year. The emission limits contained within the 1995 DOE Order supercede the

conditions in PSD-X80-11, therefore it is appropriate to apply streamlining to the PSD requirements.

- 12.4** PSD-X80-11, Condition 1 – Emissions of hydrocarbons from the hog fuel boiler – This condition applies to the hog fuel boiler by limiting emissions of hydrocarbons to 160 pounds per hour and 701 tons per year. This applicable requirement has not been included in the AOP due to the fact that Order No. DE 95AQ-E131, First Amendment includes a condition (Approval Condition 2.2) that limits hydrocarbon emissions from the hog fuel boiler to 55 pounds per hour and 210 tons per year. Since the limits imposed by the NOC Order are clearly more stringent and are expressed in the same units as the condition in PSD-X80-11, it is appropriate to apply streamlining to this requirement.
- 12.5** 40 CFR 60.49b(w), 07/01/01 – Reporting Frequency – This reporting frequency requirement applies to reporting requirements imposed by 40 CFR 60, Subpart Db. The only reporting requirement that applies to the KFGS imposed by Subpart Db is the requirement for deviations reports. This reporting frequency requirement states that the deviation reports must be submitted at least every six (6) months. This requirement has not been included in the AOP as an ongoing requirement because Standard Conditions 1.13.2 of the AOP requires deviations reports to be submitted once per month. The AOP standard condition is clearly more stringent than the frequency required by Subpart Db.

13.0 Clarifications and Interpretations

- 13.1** Section 1 - Standard Conditions – For permit conditions required by Washington State regulations that have been included in the SIP, two dates are given. The first date is the date for the regulation that was adopted into the SIP. The second date is for the most up-to-date version of the regulation. State-only enforceable permit conditions are identified with the symbol (S).
- 13.2** Recordkeeping retention time – Multiple permits that apply to the permittee (Order No. DE 95AQ-E131 Second Amendment, Order No. PSD-X80-11) include conditions which require applicable recordkeeping/reporting to be maintained for a period of time less than five years. However, Standard Condition 1.27.3 of the AOP requires that the permittee retain all records or information of this type for a period of at least five (5) years. Due to the fact that the five (5) year requirement included in the standard condition is more stringent, this is the requirement that has been included in the appropriate MRRR's. However, the conditions included in the NOC and PSD permits still apply to the permittee and therefore have been included in the AOP under the column labeled Condition, Emission Standard, or Work Practice. The specific conditions that this applies to are listed below.
- 13.2.1** Order No. DE 95AQ-E131 Second Amendment – Approval Condition(s) 1 and 4
- 13.2.2** Order No. PSD-X80-11 – Approval Condition(s) 6b
- 13.3** WAC 173-401-620(1) – Acid Rain Provisions. The permittee is not an affected party as specified in the referenced section of the WAC. Due to this, no permit conditions relating to the acid rain provisions of the FCAA have been included in the AOP. As stated in correspondence dated 11/22/94 from Ms. Kathy A. Barylski of the USEPA to Mr. W. Lester Bryan of the Washington Water Power Company (now Avista Corporation), the KFGS was determined to be “a solid waste incineration unit under §129(g) of the Clean Air Act and exempt from the Title IV (Acid Rain) requirements...”. Additionally, in the Federal Register (Vol. 61 No. 250) dated Friday, December 27, 1996, USEPA states that “Kettle Falls in Washington also should be deleted from Table 2 and excluded from the Acid Rain Program as a solid waste incinerator under § 72.6(b)(7).” This determination was made based on the fact that initially the KFGS was

thought to be fired on oil and natural gas. The subsequent determination that the facility is exempt was made based on the fact that the KFGS is fired primarily on hog fuel.

- 13.4** WAC 173-401-510(2)(h)(i) – Compliance Plan. At the time of permit issuance, no ongoing applicable requirements have been identified with which the permittee is not currently in compliance. However, this does not preclude Ecology from taking future action on past non-compliance.
- 13.5** Chapter 173-425 WAC, Open Burning – The requirements restricting open burning in the State of Washington apply to the source, and therefore Chapter 173-425 has been included as an applicable requirement under Section 2.1 Facility Wide Requirements. However, Order No. DE 95AQ-E131 includes a permit condition that prohibits open burning on the facility site. The purpose of this statement is to clarify that while Chapter 173-425 WAC does apply to the permittee, the specific condition in the Order cited is more restrictive and thus takes precedence over Chapter 173-425 WAC.
- 13.6** 40 CFR 60.40a, Standards of Performance for Electric Utility Steam Generating Units for which Construction is Commenced After September 18, 1978 – These standards apply to electric steam generating units that have the capability to combust more than 73 megawatts (250 million BTU/hr) heat input of fossil fuel, either alone or in conjunction with any other fuel. Avista KFGS underwent modification (as documented in correspondence located in the facility General file) in 1995 to physically limit the amount of natural gas that could be fired in the boiler. The manner by which the firing capacity of the boiler was reduced involved plugging a certain number of the nozzles available for delivery of natural gas into the combustion chamber. The natural gas firing capacity of the boiler was reduced to approximately 242.5 MBTU/hr heat input. Due to this modification, 40 CFR 60.40a – 60.49a (Subpart Da) does not apply to the unit.
- 13.7** Applicability of 40 CFR 60, Subpart Db – 40 CFR 60, Subpart Db is applicable to the KFGS due to the fact that the plant has heat input capacity greater than 100 MMBTU/hr (from all fuels) and the plant underwent modification to the induced draft fan in 1995 that increased potential emissions of criteria pollutants, including NO_x. In a recent amendment to Order No. DE95AQ-E131, Avista Corporation requested to limit natural gas combustion to less than 10% of the total heat input to KFGS (annual capacity factor less than 0.10). Due to this natural gas limit, the only requirements from Subpart Db that apply to the facility are those related to particulate matter.
- 13.8** 40 CFR 60.43b(c)(1), Particulate Matter Emissions – Since the KFGS has an annual capacity factor for wood waste combustion greater than 0.30, the applicable particulate matter limit is 0.10 lb/MMBTU heat input. Considering that the estimated peak heat input to the KFGS over a one hour period is 855 MMBTU, the estimated particulate matter limit would be 85.5 lb per hour. (This estimate is based on 95 tons of hog fuel combusted and 4500 BTU/lb (dry) heating value for hog fuel.) Currently, the KFGS is subject to a particulate matter emission limitation of 26 lb/hr by Order No. DE 95AQ-E131, 1st Amendment. Due to the fact that the limit imposed by the Order is significantly more stringent, monitoring, recordkeeping and reporting requirements which are deemed adequate to gain a reasonable assurance of compliance with the 26 lb/hr limit shall be considered adequate with regard to the limit imposed by 40 CFR 60, Subpart Db.
- 13.9** 5M Visual Emission Walk-Around Surveys – These surveys are to be performed as the monitoring method by which a reasonable assurance of compliance is obtained. In some cases, as in Condition 2.1.1 of the AOP, the “Testing” column of the AOP includes a reference to either an EPA reference test method, or an Ecology reference test method. The testing column is not intended to imply that personnel must be certified in those test methods in order to be eligible to perform the visual survey described in 5M. The purpose of the testing column is simply to

clarify the reference test method which would be used were certified testing deemed necessary. As a specific example, plant personnel are not required to be RM 9 or RM 9A certified in order to perform the visual survey required by 5M.

13.10 Benzene and SO₂ Emissions from the Hog Fuel Boiler – During the winter and early spring of 2003, the permittee submitted requests for permit amendments to the emission limits for benzene and SO₂ that apply to the main hog fuel fired boiler. Both requests were triggered by the results of source testing conducted in October 2002. The 2002 testing indicated that the benzene emissions were in excess of the limits established by notice of construction Order No. DE 95AQ-E131. This discovery triggered an evaluation of the method used to establish the limit included in the NOC order. Review of the calculations revealed an error in the emission factor used to establish the emission limit. Ecology agreed that the benzene emission limit should be modified in light of this error to be based on the most current testing data. The October 2002 testing also resulted in emissions of SO₂ that exceeded the limit established in the NOC Order. Upon evaluation of the methods used to establish this limit, it was discovered that the emission testing had not been performed in complete accordance with the specifics outlined in 40 CFR 60, Appendix A. However, it was clear that any SO₂ emissions from the boiler would be strictly a function of the sulfur content of the hog fuel and natural gas combusted. Since the sulfur content of hog fuel is very low, and the permittee has no control over it, Ecology agreed with the permittee's assertion that the SO₂ emission limit was unnecessary. Ecology considered that SO₂ emissions are indirectly limited because of the fact that the facility is only allowed to combust hog fuel and natural gas (10%).

13.11 Prescribed Testing Methods for Emissions of Formaldehyde, Acetaldehyde, and Benzene from the Hog Fuel Boiler – The AOP has not specified the test methods to be used for future emission testing for these pollutants. The reason for this is that the methods for these pollutants have undergone changes in the past few years, with the most accurate method having changed. Since it is unclear whether the preferred method for measuring emissions of these pollutants will stay constant over the life of the permit, the decision was made to not specify the method, leaving the determination up to agency personnel for approval of future testing protocols.

14.0 Appendix A – Site Plan of Kettle Falls Generating Station

15.0 Appendix B – Process Flow and Site Layout Diagrams

15.1 Wood Waste Receiving, Handling and Storage Flow Diagram

15.2 Power Block (Hog Fuel Boiler) Flow Diagram

15.3 Ash Handling System Flow Diagram

15.4 Water Treatment Flow Diagram

15.5 Cooling Tower Flow Diagram

15.6 Wastewater Treatment Flow Diagram